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Please find below and/or attached an Office communication concerning this application or proceeding.

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**BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES**

Application Number: 10/525,132
Filing Date: February 16, 2005
Appellant(s): LAGRANGE ET AL.

William S. Francos
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed December 9, 2008 appealing from the Office action mailed May 29, 2008.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is correct.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is substantially correct. The changes are as follows:

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of US 6,101,238 to Murthy et al. and WO 01/69282 to Entekin et al.

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Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Murthy et al. and Entrekin et al as applied to claim 2, in further view of US 5,920,657 to Bender et al.

NEW GROUND(S) OF REJECTION

A new grounds of rejection of claims 1-4 under 35 USC 101 is advanced herein below.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

US 6,101,238	Murthy et al.	8-2000
WO 01/69282 A2	Entrekin et al.	9-2001
US 5,920,657	Bender et al.	7-1999

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of US 6,101,238 to Murthy et al. (hereafter referred to as "Murthy") and WO 01/69282 to Entrekin et al. (hereafter referred to as "Entrekin").

Regarding claim 1, Murthy discloses a method for combining images of the same object (col. 2, lines 23-35) including the steps of:

seeking contours representing an interface on the images to be combined, said search step being intended to define interest areas close to said representative contours (col. 4, line 1 - col. 5, line 59; col. 7, lines 8-18, *background detection and elimination*),

analyzing interest areas, said analysis step being intended to allocate weights to the points in said interest areas and to the points corresponding to said interest areas on the various images (col. 5, lines 60 – col. 6, line 44; col. 7, lines 42-48, *emphasis field extraction*),

constructing a combination image, a point on the combination image corresponding to a point on at least one interest area being obtained from a weighting of the corresponding points on the images to be combined according to the weights allocated in said analysis step (col. 10, lines 15-25, *compound image generator combining pixels using weighting from emphasis fields*).

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Murthy discloses the device is used for combining x-ray images but is silent with regard to the method's use in combining ultrasonic images.

Entrekin teaches an ultrasonic diagnostic imaging system and method that generates a compound image in which the image data has been weighted prior to combining (Fig. 1; page 3, line 19 - page 5, line 33).

The Supreme Court has held that in analyzing the obviousness of combining elements, a court need not find specific teachings, but rather may consider "the background knowledge possessed by a person having ordinary skill in the art" and "the inferences and creative steps that a person of ordinary skill in the art would employ." See *KSR Int'l v. Teleflex Inc.*, 127 S. Ct. 1727, 1740-41, 82 USPQ2d 1385, 1396 (2007). To be nonobvious, an improvement must be "more than predictable use of prior art elements according to their established functions." *Id.* The Supreme Court further stated that: When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. *Id.* at ___, 82 USPQ2d at 1396. When considering obviousness of a combination of known elements, the operative question is thus "whether the improvement is more than the predictable use of prior art elements according to their established functions." *Id.* at ___, 82 USPQ2d at 1396.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Murthy and Entrekin such that method taught by Murthy is modified for use in combining ultrasonic images such as those obtained from an ultrasonic imaging device as disclosed by Entrekin. The processing technique of Murthy could be modified for combining ultrasonic images according to methods well known to those skilled in the art of image processing, for example, through software modification. In the combination, the method of Murthy would still perform its original function of combining diagnostic images. Furthermore, Murthy et al. clearly discloses one object of the invention is explicit extraction and use of semantic knowledge for the purpose of diagnostic compound image generation and further states “[k]nowledge of semantically significant visual events in the constituent images, as well as knowledge about the purpose of compounding, can substantially improve the accuracy and efficiency of automatic image compositing” (col. 2, lines 12-20). One of ordinary skill in the art would recognize this incentive and be motivated to utilize the method disclosed by Murthy because it provides substantially improved accuracy and efficiency of automatic image compositing compared to methods that do not. The result of the Murthy and Entrekin combination would be predictable in that ultrasonic images, such as those obtained from the system disclosed by Entrekin, are accurately and efficiently combined according to the method of Murthy.

Regarding claim 2, the combination of Murthy and Entrekin as applied above further discloses analyzing comprises a step of evaluating similarity of the interest areas on the ultrasonic images to be combined, the weights being allocated to the various points

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in said interest areas and to their corresponding points according to said similarity (Murthy, col. 7, line 42 – col. 8, line 14).

Regarding claim 3, the combination of Murthy and Entrekin as applied above further discloses analyzing comprises a step of estimating the contrast within at least two interest areas present and similar on two images, the weights being allocated to the various points in said interest areas according to said estimated contrast (Murthy, col. 10, lines 26-40).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Murthy, Entrekin and US 5,920,657 as applied to claim 2 above, in further view of US 5,920,657 to Bender et al. (previously cited, hereafter referred to as “Bender”).

Regarding claim 4, Murthy is silent with regard to at least two images to be combined having different resolutions and is therefore silent with regard to a step of evaluating these resolutions with at least two interest areas present and similar on two said images, the weights being allocated to the various points in said interest areas on said two images according to said resolutions.

Entrekin teaches an ultrasonic diagnostic imaging system and method that generates a compound image from images of different resolutions in which the image data has been weighted prior to combining (Fig. 1; page 3, line 19 - page 5, line 33). Entrekin does not explicitly disclose the images are of different resolutions. However, the background section of Appellant’s specification discussing the prior art of WO 01/69282 to Entrekin recites, “[i]mages with various resolutions are then combined since the 2D or

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3D image of a localized reflector (that is to say the function of the response of the imaging system to a pulse) is highly anisotropic.” (page 2, lines 7-10). Thus it is admitted prior art that WO 01/69282 to Entrekin teaches images of different resolutions being combined. Entrekin is silent with regard to the details of how the images are weighted.

The combination of Murthy and Entrekin described above does not disclose evaluating the resolutions within at least two interest areas present and similar on two said images, the weights being allocated to the various points in said interest areas on said two images according to said resolutions. Bender teaches a system and method in which a plurality of images of different resolutions are combined by evaluating the resolutions and weighting the images based on the resolution of the image (col. 17, lines 37-53).

It would have been obvious to one of ordinary skill in art at the time the invention was made to combine the teachings of Murthy, Entrekin and Bender such that the method taught by the combination of Murthy and Entrekin described above is modified to include evaluating the resolutions and allocating weights according to the resolutions, evaluating the resolutions within at least two interest areas present and similar on said two images, the weights being allocated to the various points in said interest areas on said two image according to said resolutions. This combination would predictably result in preventing noticeable edges demarking the boundaries between the images from appearing (Bender, col. 17, lines 37-53) thereby improving appearance of the combined image. It has been held that “[t]he combination of familiar elements according to known methods is likely to be obvious when it does not more than yield predictable results.” *KSR.*, 127 S. Ct. at 1739, 82USPQ2d at 1395 (2007) (citing *Graham*, 383 U.S. at 12)

NEW GROUNDS OF REJECTION

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-4 are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. Supreme Court precedent¹ and recent Federal Circuit decisions² indicate that a statutory “process” under 35 U.S.C. 101 must (1) be tied to a particular machine or apparatus, or (2) transform a particular article to a different state or thing. This is referred to as the “machine or transformation test”, whereby the recitation of a particular machine or transformation of an article must impose meaningful limits on the claim's scope to impart patent-eligibility (See *Benson*, 409 U.S. at 71-72), and the involvement of the machine or transformation in the claimed process must not merely be insignificant extra-solution activity (See *Flook*, 437 U.S. at 590”). While the instant claims recite a series of steps or acts to be performed, the claims neither transform an article nor positively tie to a particular machine that accomplishes the claimed method steps, and therefore do not qualify as a statutory process. The method for combining ultrasonic images recited in claim 1, including the steps of seeking contours, analyzing interest areas and constructing a combination image does not positively recite the steps as being performed by a particular machine or apparatus.

¹ *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).

² *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

(10) Response to Argument

Appellant contends the rejection of claims 1-4 is improper because that the combination of references is improper and because Murthy et al. fails to disclose at least one feature of claim 1.

With regard to the alleged missing feature, Appellant contends Murthy et al. fails to disclose or suggest "...seeking contours representing an interface on the ultrasonic images to be combined, said search step being intended to define interest areas close to said representative contours..." as recited in claim 1. Examiner concedes Murthy et al. does not disclose ultrasonic images, as is clearly evidenced in the record, thus its combination with the teachings of Entrekin (which has also been contested and will be addressed following). As to "seeking contours representing an interface," Appellant correctly identifies the cited portions of Murthy et al. as being drawn to the detection of elimination of background prior to alignment but fails to understand its correspondence with the claim limitation. Murthy et al. discloses, "the number of possible overlap positions between two constituent images as well as the significant portion of a constituent x-ray images is background which does not contribute towards alignment, eliminating background prior to alignment increases computational efficiency" (column 7, lines 10-17). In eliminating the background portions of the image, all portions of the image outside the contours of foreground object are eliminated and all that remains is the foreground object. The reduction in the size of the image is limited to the contours of the foreground object and the subsequent alignment is based upon evaluating the overlap positions of the reduced size images. The "overlapping positions of the images" corresponds to the claimed "interface". The detection and elimination of background,

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thereby defining the contours of the object, corresponds to "seeking contours". Examiner notes the recitation of "said search step being intended to define interest areas close to said representative contours" is a recitation of an intended result of the search and is not positively required by claim language. None-the-less, the remaining image portion which corresponds to the object after background elimination is subsequently the basis for image alignment therefore corresponds to interest areas close to said representative contours". As such, Murthy et al. is not deficient in its disclosure of the contended claim element to the extent relied upon by the Examiner. Therefore, the combination of Murthy et al. and Entrekin et al. disclose each and every limitation of claim 1.

Appellants "proffer that the total and complete silence on the applicability of the teachings of Murthy et al. to any other imaging technology may suggest that for reasons undisclosed in the reference, the teachings are not usefully applied to other than x-ray imaging."

Murthy et al.'s silence with regard to the technique's application beyond x-ray imaging is neither an explicit, implicit or inherent teaching away from the technique's use in combining other types of images, including ultrasonic images. Nor is its silence sufficient evidence showing there was no reasonable expectation of success or would not yield predictable results if applied to images from other modalities. Appellant has not provided any evidence showing there would be no reasonable expectation of success or that the results would be unpredictable if the technique were applied to ultrasonic images. The Examiner notes that when a digital image is processed, it is irrelevant whether a image is ultrasonic or x-ray because the image will only be a collection of numbers.

Appellant submits that because the Murthy et al. reference does not explicitly teach or suggest its processing technique's application to other imaging technologies other than the disclosed x-ray images, there is no basis for combining the teachings of Murthy et al. with Entrekin et al. "but for the use of their claims as a guide to rejection."

In response to the above argument, while a suggestion or motivation to combine references is an appropriate method for determining obviousness, it is just one of a number of valid rationales for doing so. The Court in KSR identified several exemplary rationales to support a conclusion of obviousness which are consistent with the proper "functional approach" to the determination of obviousness as laid down in Graham. *KSR*, 550 U.S. at ___, 82 USPQ2d at 1395-97. See MPEP § 2141 and § 2143. Further, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Appellant quotes a mere three lines of the Examiner's response to arguments from the Advisory Action mailed on September 5, 2008 and asserts the Examiner has provided "a conclusory statement as to the foresight that one skilled in the art would garner from the teachings of Murthy et al., without evidence in support thereof" and states "rejections on obviousness grounds cannot be sustained by mere conclusory statements: there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." Appellant further suggests examples of evidence that would

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support a conclusion of obviousness. Again, Appellant appears to assert that a rationale supporting a rejection based on obviousness can only be shown by a teaching, suggestion or motivation explicitly disclosed in the references. Appellant's arguments ignore the rationale articulated by the Examiner in the rejection of the claim 1 in the Final Office Action mailed May 29, 2008 (see pages 4 and 5) and further discussed in the Advisory Action mailed September 5, 2008.

MPEP 2141 states:

The Supreme Court in *KSR* reaffirmed the familiar framework for determining obviousness as set forth in *Graham v. John Deere Co.* (383 U.S. 1, 148 USPQ 459 (1966)), but stated that the Federal Circuit had erred by applying the teaching-suggestion-motivation (TSM) test in an overly rigid and formalistic way. *KSR*, 550 U.S. at ___, 82 USPQ2d at 1391. Specifically, the Supreme Court stated that the Federal Circuit had erred in four ways: (1) "by holding that courts and patent examiners should look only to the problem the patentee was trying to solve" (*Id.* at ___, 82 USPQ2d at 1397); (2) by assuming "that a person of ordinary skill attempting to solve a problem will be led only to those elements of prior art designed to solve the same problem" (*Id.*); (3) by concluding "that a patent claim cannot be proved obvious merely by showing that the combination of elements was obvious to try" (*Id.*); and (4) by overemphasizing "the risk of courts and patent examiners falling prey to hindsight bias" and as a result applying "[r]igid preventative rules that deny factfinders recourse to common sense" (*Id.*).

In *KSR*, the Supreme Court particularly emphasized "the need for caution in granting a patent based on the combination of elements found in the prior art," *Id.* at ___, 82 USPQ2d at 1395, and discussed circumstances in which a patent might be determined to be obvious. Importantly, the Supreme Court reaffirmed principles based on its precedent that "[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *Id.* at ___, 82 USPQ2d at 1395. The Supreme Court stated that there are "[t]hree cases decided after *Graham* [that] illustrate this doctrine." *Id.* at ___, 82 USPQ2d at 1395. (1) "In *United States v. Adams*, . . . [t]he Court recognized that when a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result." *Id.* at ___, 82 USPQ2d at 1395.

The Supreme Court further stated that: When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. *Id.* at ___, 82 USPQ2d at 1396. When considering obviousness of a combination of known elements, the operative question is thus "whether the improvement is more than the predictable use of prior art elements according to their established functions." *Id.* at ___, 82 USPQ2d at 1396.

In rejecting claim 1 under 35 U.S.C. 103(a) as unpatentable over the combination of Murthy et al. and Entrekin et al., the Examiner applies a “functional approach” in making a determination of obviousness. The Examiner has clearly articulated all the claimed elements are taught by the references, collectively; that one skilled in the art could have combined the elements using known methods; and that the features/elements relied upon in both references still perform the same functions in the combination as they did separately. Murthy et al. still performs background detection and elimination, emphasis field extraction and compound image generation using weighting from the emphasis fields. Entrekin et al. still captures ultrasonic images that need to be combined. Further, the Examiner has clearly articulated that the combination would have been predictable to one of ordinary skill in the art. The predictable result is a combination image of the ultrasonic images that have been obtained by the ultrasonic diagnostic imaging system disclosed by Entrekin et al. combined according to the technique disclosed by Murthy et al..

Additionally, in the rejection of claim 1 presented in the Final Office action (pages 4 and 5), the Examiner concluded the combination would predictably result in improved accuracy and efficiency of the image compositing of the ultrasonic images based on disclosure in column 2, lines 12-20 of Murthy et al.. As previously identified by the Examiner in the Advisory Action mailed September 5, 2008, while the Examiner had indicated “substantially improved accuracy and efficiency of image compositing” as a predictable result, one of ordinary skill in the art would have also identified this a benefit provided by Murthy's method, and therefore, a motivation for its application to other imaging modalities for which a combined image may be desired. Appellant's requirement

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for a teaching, suggestion or motivation for combining the references had already been provided in the citation from the Murthy et al. reference. Examiner has included this motivation in the rejection recited herein above.

The obviousness rationale advanced previously and herein above is consistent with the criteria articulated in *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d 1385 (U.S. 2007). Each and every feature of the claim taught by the references, collectively, and rejection is consistent with both the “functional approach” and teaching-suggestion-motivation approach in determining obviousness.

Appellant has provided no further arguments with regard to dependent claims 2-4, relying upon the same reasoning as applied to claim 1.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner’s answer.

For the above reasons, it is believed that the rejections should be sustained.

This examiner’s answer contains a new ground of rejection set forth in section (9) above. Accordingly, appellant must within **TWO MONTHS** from the date of this answer exercise one of the following two options to avoid *sua sponte* dismissal of the **appeal** as to the claims subject to the new ground of rejection:

(1) **Reopen prosecution.** Request that prosecution be reopened before the primary examiner by filing a reply under 37 CFR 1.111 with or without amendment, affidavit or other evidence. Any amendment, affidavit or other evidence must be relevant

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to the new grounds of rejection. A request that complies with 37 CFR 41.39(b)(1) will be entered and considered. Any request that prosecution be reopened will be treated as a request to withdraw the appeal.

(2) Maintain appeal. Request that the appeal be maintained by filing a reply brief as set forth in 37 CFR 41.41. Such a reply brief must address each new ground of rejection as set forth in 37 CFR 41.37(c)(1)(vii) and should be in compliance with the other requirements of 37 CFR 41.37(c). If a reply brief filed pursuant to 37 CFR 41.39(b)(2) is accompanied by any amendment, affidavit or other evidence, it shall be treated as a request that prosecution be reopened before the primary examiner under 37 CFR 41.39(b)(1).

Extensions of time under 37 CFR 1.136(a) are not applicable to the TWO MONTH time period set forth above. See 37 CFR 1.136(b) for extensions of time to reply for patent applications and 37 CFR 1.550(c) for extensions of time to reply for ex parte reexamination proceedings.

Respectfully submitted,

/Anthony Mackowey/

A Technology Center Director or designee must personally approve the new ground(s) of rejection set forth in section (9) above by signing below:

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Conferees:

/Matthew C Bella/

Supervisory Patent Examiner, Art Unit 2624

/Bhaves M Mehta/

Supervisory Patent Examiner, Art Unit 2624


DIRECTOR TC 2600



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analyzing interest areas, said analysis step being intended to allocate weights to the points in said interest areas and to the points corresponding to said interest areas on the various images (col. 5, lines 60 – col. 6, line 44; col. 7, lines 42-48, *emphasis field extraction*),

constructing a combination image, a point on the combination image corresponding to a point on at least one interest area being obtained from a weighting of the corresponding points on the images to be combined according to the weights allocated in said analysis step (col. 10, lines 15-25, *compound image generator combining pixels using weighting from emphasis fields*).

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It would have been obvious to one of ordinary skill in the art at the time the invention was made to combine the teachings of Murthy and Entrekin such that method taught by Murthy is modified for use in combining ultrasonic images such as those obtained from an ultrasonic imaging device as disclosed by Entrekin. The processing technique of Murthy could be modified for combining ultrasonic images according to methods well known to those skilled in the art of image processing, for example, through software modification. In the combination, the method of Murthy would still perform its original function of combining diagnostic images. Furthermore, Murthy et al. clearly discloses one object of the invention is explicit extraction and use of semantic knowledge for the purpose of diagnostic compound image generation and further states “[k]nowledge of semantically significant visual events in the constituent images, as well as knowledge about the purpose of compounding, can substantially improve the accuracy and efficiency of automatic image compositing” (col. 2, lines 12-20). One of ordinary skill in the art would recognize this incentive and be motivated to utilize the method disclosed by Murthy because it provides substantially improved accuracy and efficiency of automatic image compositing compared to methods that do not. The result of the Murthy and Entrekin combination would be predictably in that ultrasonic images, such as those obtained from the system disclosed by Entrekin, are accurately and efficiently combined according to the method of Murthy.

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in said interest areas and to their corresponding points according to said similarity (Murthy, col. 7, line 42 – col. 8, line 14).

Regarding claim 3, the combination of Murthy and Entrekin as applied above further discloses analyzing comprises a step of estimating the contrast within at least two interest areas present and similar on two images, the weights being allocated to the various points in said interest areas according to said estimated contrast (Murthy, col. 10, lines 26-40).

Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Murthy, Entrekin and US 5,920,657 as applied to claim 2 above, in further view of US 5,920,657 to Bender et al. (previously cited, hereafter referred to as “Bender”).

Regarding claim 4, Murthy is silent with regard to at least two images to be combined having different resolutions and is therefore silent with regard to a step of evaluating these resolutions with at least two interest areas present and similar on two said images, the weights being allocated to the various points in said interest areas on said two images according to said resolutions.

Entrekin teaches an ultrasonic diagnostic imaging system and method that generates a compound image from images of different resolutions in which the image data has been weighted prior to combining (Fig. 1; page 3, line 19 - page 5, line 33). Entrekin does not explicitly disclose the images are of different resolutions. However, the background section of Appellant’s specification discussing the prior art of WO 01/69282 to Entrekin recites, “[i]mages with various resolutions are then combined since the 2D or

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3D image of a localized reflector (that is to say the function of the response of the imaging system to a pulse) is highly anisotropic.” (page 2, lines 7-10). Thus it is admitted prior art that WO 01/69282 to Entrekin teaches images of different resolutions being combined. Entrekin is silent with regard to the details of how the images are weighted.

The combination of Murthy and Entrekin described above does not disclose evaluating the resolutions within at least two interest areas present and similar on two said images, the weights being allocated to the various points in said interest areas on said two images according to said resolutions. Bender teaches a system and method in which a plurality of images of different resolutions are combined by evaluating the resolutions and weighting the images based on the resolution of the image (col. 17, lines 37-53).

It would have been obvious to one of ordinary skill in art at the time the invention was made to combine the teachings of Murthy, Entrekin and Bender such that the method taught by the combination of Murthy and Entrekin described above is modified to include evaluating the resolutions and allocating weights according to the resolutions, evaluating the resolutions within at least two interest areas present and similar on said two images, the weights being allocated to the various points in said interest areas on said two image according to said resolutions. This combination would predictably result in preventing noticeable edges demarking the boundaries between the images from appearing (Bender, col. 17, lines 37-53) thereby improving appearance of the combined image. It has been held that “[t]he combination of familiar elements according to known methods is likely to be obvious when it does not more than yield predictable results.” *KSR.*, 127 S. Ct. at 1739, 82USPQ2d at 1395 (2007) (citing *Graham*, 383 U.S. at 12)

NEW GROUNDS OF REJECTION

Claim Rejections - 35 USC § 101

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

Claims 1-4 are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. Supreme Court precedent¹ and recent Federal Circuit decisions² indicate that a statutory “process” under 35 U.S.C. 101 must (1) be tied to a particular machine or apparatus, or (2) transform a particular article to a different state or thing. This is referred to as the “machine or transformation test”, whereby the recitation of a particular machine or transformation of an article must impose meaningful limits on the claim's scope to impart patent-eligibility (See *Benson*, 409 U.S. at 71-72), and the involvement of the machine or transformation in the claimed process must not merely be insignificant extra-solution activity (See *Flook*, 437 U.S. at 590”). While the instant claims recite a series of steps or acts to be performed, the claims neither transform an article nor positively tie to a particular machine that accomplishes the claimed method steps, and therefore do not qualify as a statutory process. The method for combining ultrasonic images recited in claim 1, including the steps of seeking contours, analyzing interest areas and constructing a combination image does not positively recite the steps as being performed by a particular machine or apparatus.

¹ *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).

² *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

(10) Response to Argument

Appellant contends the rejection of claims 1-4 is improper because that the combination of references is improper and because Murthy et al. fails to disclose at least one feature of claim 1.

With regard to the alleged missing feature, Appellant contends Murthy et al. fails to disclose or suggest "...seeking contours representing an interface on the ultrasonic images to be combined, said search step being intended to define interest areas close to said representative contours..." as recited in claim 1. Examiner concedes Murthy et al. does not disclose ultrasonic images, as is clearly evidenced in the record, thus its combination with the teachings of Entrekin (which has also been contested and will be addressed following). As to "seeking contours representing an interface," Appellant correctly identifies the cited portions of Murthy et al. as being drawn to the detection of elimination of background prior to alignment but fails to understand its correspondence with the claim limitation. Murthy et al. discloses, "the number of possible overlap positions between two constituent images as well as the significant portion of a constituent x-ray images is background which does not contribute towards alignment, eliminating background prior to alignment increases computational efficiency" (column 7, lines 10-17). In eliminating the background portions of the image, all portions of the image outside the contours of foreground object are eliminated and all that remains is the foreground object. The reduction in the size of the image is limited to the contours of the foreground object and the subsequent alignment is based upon evaluating the overlap positions of the reduced size images. The "overlapping positions of the images" corresponds to the claimed "interface". The detection and elimination of background,

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thereby defining the contours of the object, corresponds to "seeking contours". Examiner notes the recitation of "said search step being intended to define interest areas close to said representative contours" is a recitation of an intended result of the search and is not positively required by claim language. None-the-less, the remaining image portion which corresponds to the object after background elimination is subsequently the basis for image alignment therefore corresponds to interest areas close to said representative contours". As such, Murthy et al. is not deficient in its disclosure of the contended claim element to the extent relied upon by the Examiner. Therefore, the combination of Murthy et al. and Entrekin et al. disclose each and every limitation of claim 1.

Appellants "proffer that the total and complete silence on the applicability of the teachings of Murthy et al. to any other imaging technology may suggest that for reasons undisclosed in the reference, the teachings are not usefully applied to other than x-ray imaging."

Murthy et al.'s silence with regard to the technique's application beyond x-ray imaging is neither an explicit, implicit or inherent teaching away from the technique's use in combining other types of images, including ultrasonic images. Nor is its silence sufficient evidence showing there was no reasonable expectation of success or would not yield predictable results if applied to images from other modalities. Appellant has not provided any evidence showing there would be no reasonable expectation of success or that the results would be unpredictable if the technique were applied to ultrasonic images. The Examiner notes that when a digital image is processed, it is irrelevant whether a image is ultrasonic or x-ray because the image will only be a collection of numbers.

Appellant submits that because the Murthy et al. reference does not explicitly teach or suggest its processing technique's application to other imaging technologies other than the disclosed x-ray images, there is no basis for combining the teachings of Murthy et al. with Entekin et al. "but for the use of their claims as a guide to rejection."

In response to the above argument, while a suggestion or motivation to combine references is an appropriate method for determining obviousness, it is just one of a number of valid rationales for doing so. The Court in KSR identified several exemplary rationales to support a conclusion of obviousness which are consistent with the proper "functional approach" to the determination of obviousness as laid down in Graham. *KSR*, 550 U.S. at ___, 82 USPQ2d at 1395-97. See MPEP § 2141 and § 2143. Further, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the applicant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Appellant quotes a mere three lines of the Examiner's response to arguments from the Advisory Action mailed on September 5, 2008 and asserts the Examiner has provided "a conclusory statement as to the foresight that one skilled in the art would garner from the teachings of Murthy et al., without evidence in support thereof" and states "rejections on obviousness grounds cannot be sustained by mere conclusory statements: there must be some articulated reasoning with some rational underpinning to support the legal conclusion of obviousness." Appellant further suggests examples of evidence that would

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support a conclusion of obviousness. Again, Appellant appears to assert that a rationale supporting a rejection based on obviousness can only be shown by a teaching, suggestion or motivation explicitly disclosed in the references. Appellant's arguments ignore the rationale articulated by the Examiner in the rejection of the claim 1 in the Final Office

Action mailed May 29, 2008 (see pages 4 and 5) and further discussed in the Advisory

Action mailed September 5, 2008.

MPEP 2141 states:

The Supreme Court in *KSR* reaffirmed the familiar framework for determining obviousness as set forth in *Graham v. John Deere Co.* (383 U.S. 1, 148 USPQ 459 (1966)), but stated that the Federal Circuit had erred by applying the teaching-suggestion-motivation (TSM) test in an overly rigid and formalistic way. *KSR*, 550 U.S. at ___, 82 USPQ2d at 1391. Specifically, the Supreme Court stated that the Federal Circuit had erred in four ways: (1) "by holding that courts and patent examiners should look only to the problem the patentee was trying to solve" (*Id.* at ___, 82 USPQ2d at 1397); (2) by assuming "that a person of ordinary skill attempting to solve a problem will be led only to those elements of prior art designed to solve the same problem" (*Id.*); (3) by concluding "that a patent claim cannot be proved obvious merely by showing that the combination of elements was obvious to try" (*Id.*); and (4) by overemphasizing "the risk of courts and patent examiners falling prey to hindsight bias" and as a result applying "[r]igid preventative rules that deny factfinders recourse to common sense" (*Id.*).

In *KSR*, the Supreme Court particularly emphasized "the need for caution in granting a patent based on the combination of elements found in the prior art," *Id.* at ___, 82 USPQ2d at 1395, and discussed circumstances in which a patent might be determined to be obvious. Importantly, the Supreme Court reaffirmed principles based on its precedent that "[t]he combination of familiar elements according to known methods is likely to be obvious when it does no more than yield predictable results." *Id.* at ___, 82 USPQ2d at 1395. The Supreme Court stated that there are "[t]hree cases decided after *Graham* [that] illustrate this doctrine." *Id.* at ___, 82 USPQ2d at 1395. (1) "In *United States v. Adams*, . . . [t]he Court recognized that when a patent claims a structure already known in the prior art that is altered by the mere substitution of one element for another known in the field, the combination must do more than yield a predictable result." *Id.* at ___, 82 USPQ2d at 1395.

The Supreme Court further stated that: When a work is available in one field of endeavor, design incentives and other market forces can prompt variations of it, either in the same field or a different one. If a person of ordinary skill can implement a predictable variation, § 103 likely bars its patentability. For the same reason, if a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill. *Id.* at ___, 82 USPQ2d at 1396. When considering obviousness of a combination of known elements, the operative question is thus "whether the improvement is more than the predictable use of prior art elements according to their established functions." *Id.* at ___, 82 USPQ2d at 1396.

In rejecting claim 1 under 35 U.S.C. 103(a) as unpatentable over the combination of Murthy et al. and Entrekin et al., the Examiner applies a “functional approach” in making a determination of obviousness. The Examiner has clearly articulated all the claimed elements are taught by the references, collectively; that one skilled in the art could have combined the elements using known methods; and that the features/elements relied upon in both references still perform the same functions in the combination as they did separately. Murthy et al. still performs background detection and elimination, emphasis field extraction and compound image generation using weighting from the emphasis fields. Entrekin et al. still captures ultrasonic images that need to be combined. Further, the Examiner has clearly articulated that the combination would have been predictable to one of ordinary skill in the art. The predictable result is a combination image of the ultrasonic images that have been obtained by the ultrasonic diagnostic imaging system disclosed by Entrekin et al. combined according to the technique disclosed by Murthy et al..

Additionally, in the rejection of claim 1 presented in the Final Office action (pages 4 and 5), the Examiner concluded the combination would predictably result in improved accuracy and efficiency of the image compositing of the ultrasonic images based on disclosure in column 2, lines 12-20 of Murthy et al.. As previously identified by the Examiner in the Advisory Action mailed September 5, 2008, while the Examiner had indicated “substantially improved accuracy and efficiency of image compositing” as a predictable result, one of ordinary skill in the art would have also identified this a benefit provided by Murthy's method, and therefore, a motivation for its application to other imaging modalities for which a combined image may be desired. Appellant's requirement

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for a teaching, suggestion or motivation for combining the references had already been provided in the citation from the Murthy et al. reference. Examiner has included this motivation in the rejection recited herein above.

The obviousness rationale advanced previously and herein above is consistent with the criteria articulated in *KSR International Co. v. Teleflex Inc.*, 82 USPQ2d 1385 (U.S. 2007). Each and every feature of the claim taught by the references, collectively, and rejection is consistent with both the “functional approach” and teaching-suggestion-motivation approach in determining obviousness.

Appellant has provided no further arguments with regard to dependent claims 2-4, relying upon the same reasoning as applied to claim 1.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner’s answer.

For the above reasons, it is believed that the rejections should be sustained.

This examiner’s answer contains a new ground of rejection set forth in section (9) above. Accordingly, appellant must within **TWO MONTHS** from the date of this answer exercise one of the following two options to avoid *sua sponte* **dismissal of the appeal** as to the claims subject to the new ground of rejection:

(1) **Reopen prosecution.** Request that prosecution be reopened before the primary examiner by filing a reply under 37 CFR 1.111 with or without amendment, affidavit or other evidence. Any amendment, affidavit or other evidence must be relevant

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to the new grounds of rejection. A request that complies with 37 CFR 41.39(b)(1) will be entered and considered. Any request that prosecution be reopened will be treated as a request to withdraw the appeal.

(2) Maintain appeal. Request that the appeal be maintained by filing a reply brief as set forth in 37 CFR 41.41. Such a reply brief must address each new ground of rejection as set forth in 37 CFR 41.37(c)(1)(vii) and should be in compliance with the other requirements of 37 CFR 41.37(c). If a reply brief filed pursuant to 37 CFR 41.39(b)(2) is accompanied by any amendment, affidavit or other evidence, it shall be treated as a request that prosecution be reopened before the primary examiner under 37 CFR 41.39(b)(1).

Extensions of time under 37 CFR 1.136(a) are not applicable to the TWO MONTH time period set forth above. See 37 CFR 1.136(b) for extensions of time to reply for patent applications and 37 CFR 1.550(c) for extensions of time to reply for ex parte reexamination proceedings.

Respectfully submitted,

/Anthony Mackowey/

A Technology Center Director or designee must personally approve the new ground(s) of rejection set forth in section (9) above by signing below:

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Conferees:

/Matthew C Bella/

Supervisory Patent Examiner, Art Unit 2624

/Bhavesh M Mehta/

Supervisory Patent Examiner, Art Unit 2624


DIRECTOR TC 2600